2010 Smile Survey Summary

King County

June 2011

Public Health
Seattle & King County

Table of Contents

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Executive Summary

Dental disease remains a common, chronic problem among children in King County, impacting their ability to eat, sleep and learn. The King County 2010 Smile Survey finds that that while children in King County enjoy better oral health compared to children in Washington state, disparities still exist for children from low-income families, children of color and children whose primary language is not English.

The Washington State Department of Health and Public Health – Seattle & King County conduct the Smile Survey every five years to monitor the trends of dental disease in children. This report details findings from the 4,000 King County children surveyed.

Key findings of the King County Survey include:

- Children from low-income families are more than twice as likely to have untreated dental disease despite the prevalence of dental programs for low-income children in King County. This suggests other barriers beyond access.
- Children of color and children whose primary language is not English are almost twice as likely to have untreated dental disease. Among minority children, Hispanic/Latino children are disproportionately impacted, demonstrating a clear need for additional education and outreach efforts.
- The use of dental sealants remains high, regardless of race/ethnicity, income or language, due in part to school-based dental sealant programs that specifically target schools with children at higher risk for dental disease. Unfortunately, these programs have been cut back as a result of ongoing budget crises.
- Children in King County continue to have less dental disease compared to children in other areas of Washington state. Greater access to fluoridated water in King County, where 80% of residents have access to fluoridated water, likely contributes to the better oral health status of King County children.

The information from these surveys is intended to help communities understand the impact that dental disease has on children, and provide information that can be used to establish programs and create systems to address those problems.

Methods

In 1996, the Washington State Department of Health (DOH) conducted its first statewide survey to help monitor the trends of dental disease in children. In 2000, as part of the second statewide survey, Public Health – Seattle & King County (Public Health) conducted its first random sample survey of second and third grade students throughout King County. In 2005, Public Health participated in the third Smile Survey, conducting a countywide random survey of second and third grade students, as well as a random survey specific to Seattle students. In 2005, DOH added a survey of children in a random sample of Head Start and ECEAP programs. Public Health also surveyed children in a random sample of preschool sites throughout the county. In 2010, DOH changed the survey to obtain information that could be used to compare Washington state data to those of other states nationwide. Kindergarten and third grade students were targeted since these are the groups surveyed by other states. DOH also surveyed children in Head Start/ECEAP programs. DOH drew random samples of schools for the state and King County surveys.

The methodology used for drawing samples for both the state survey and the King County survey (as described by DOH):

> *A list of all public schools was obtained from the Washington State Office of the Superintendant of Public Instruction (OSPI) for use in determining the sample. The data file contained the total enrollment of all students as well as that of K and 3rd grade students and number of students enrolled in the Free and Reduced Lunch (FRL) program for each public school in the state. Schools were included in the sampling frame if they had 15 or more students in K and 3rd grade and a total population of 25 students in the combined K and 3rd grades. Those that failed to meet either criterion were excluded. The remaining schools were then ranked from highest to lowest according the percent of all students' participation in the FRL program and given a unique ID number for selection purposes.*
>
> *Concurrently the number of schools to be sampled was determined. The sampling methodology took into consideration the design effect of the study and assumed a 79% response rate. The design effect and response rate were estimated based on the 2005 smile survey. Sample sizes were calculated based on expected caries prevalence of 50% and three different confidence interval ranges, +/- 3%, +/- 4% and +/- 5%. In a meeting with Oral Health staff it was decided, for budgetary reasons, to proceed with the +/- 5% precision level. This decision resulted in a final sample size of 3,606 children. Based on an average 3rd grade enrollment size of 71, 51 schools were determined to be the final sample size. The formula used for sample size calculation is $n = deff \cdot pq(1.96/0.05)^2$ Deff is design effect , p is prevalence,and q is 1-p*
>
> *SAS procedure SURVEYSELECT for systematic sampling was used to draw the sample, based on the percent of reduced or free lunch in a school. The sample was distributed by Oral Health staff to the Local Health Jurisdictions in which the schools were located.*

The elementary school sample for the King County survey included 32 schools with 4,000 children participating, for a response rate of 84%. The King County sample included some schools also drawn for the state sample.

School sites had the option of participating with positive consent or passive consent. Positive consent requires that parents sign their children up to participate, whereas passive consent allows children to be screened unless parents indicate otherwise. The same oral health measures and demographic information (race, language and FR/L participation) were collected regardless of the type of consent determined by the school.

Dental professionals conducted screenings on-site, after DOH training to assure consistency in assessments. This type of dental screening underreports dental disease, because no x-ray or other diagnostic tools are used. It also is more difficult relying on visual techniques to accurately report the presence of fillings because of the increased use of tooth colored filling materials which are harder to see than amalgam filling material.

Student characteristics included age, gender, race/ethnicity, language spoken at home, and, for elementary students, eligibility for free/reduced price lunch program as a proxy for overall socioeconomic status. Information on eligibility for free/reduced lunch program was obtained through school districts' Nutrition Services programs. Data on race/ethnicity and language spoken at home were provided by individual schools based on parent/guardian enrollment information. After the screening, all students were identified by an ID number and all names were removed to ensure confidentiality.

Oral health indicators included caries experience (either untreated or treated decay), untreated caries (decay), treated caries (decay), rampant caries (decay on seven or more teeth), dental sealants and treatment urgency. Treatment urgency is not discussed in this report. It was found in less than 1% of elementary children and in no child in Head Start. Data was entered and analyzed using the EPI-INFO program from the Centers for Disease Control and Prevention (CDC). Data was not clustered by school, and cluster analysis was not used. The Washington State data in this report was not analyzed using cluster analysis. However, the Smile Survey 2010 report released by the Department of Health does use cluster analysis for the Washington State data. The two techniques give the same results but their estimates of statistical significance may differ. To emphasize this difference, the comparisons between King County and state data will be called "substantial" rather than "significant" if differences are large enough to be significant when both sets of data are analyzed without clusters. Complete data tables are listed in the Appendix to this report. Tables of data weighted for nonresponse are included to demonstrate that there are no differences between the weighted and unweighted data. Weights were determined by dividing the number of children actually screened in any given school by the number of children enrolled in the grades of interest, K and 3rd. All data reported in the body of the report including the data from Washington state results are unweighted.

Overall Survey Findings for Elementary School Children

The 2010 Washington State Smile Survey sample included 5,733 kindergarten and third grade children. Eight participants were missing grade level information and are not included in the data. Each participating county had a county level sample drawn. In King County, this was a total of 4,000 children.

King County children are more likely to be decay free (no treated or untreated decay) and have fewer fillings (treated decay) than children living in other areas of Washington state. King County's 2010 advantage in child oral health is consistent with findings from previous Smile Surveys. While there is no difference in the 2010 rate of untreated decay between King County and the rest of the state, King County children had a substantially lower rate of rampant decay. Since rampant decay is measured as treated or untreated decay on seven or more teeth, this suggests that the difference in rampant decay reflects differences in the treated decay rate. King County data shows substantially less treated decay and less rampant decay in comparison to the data from Washington state. The rates of dental sealants in third grade students remain substanially higher in King County than the rest of the state.

Table 1: Oral Health Measures for Screened Elementary School Children, Washington State and King County, 2010

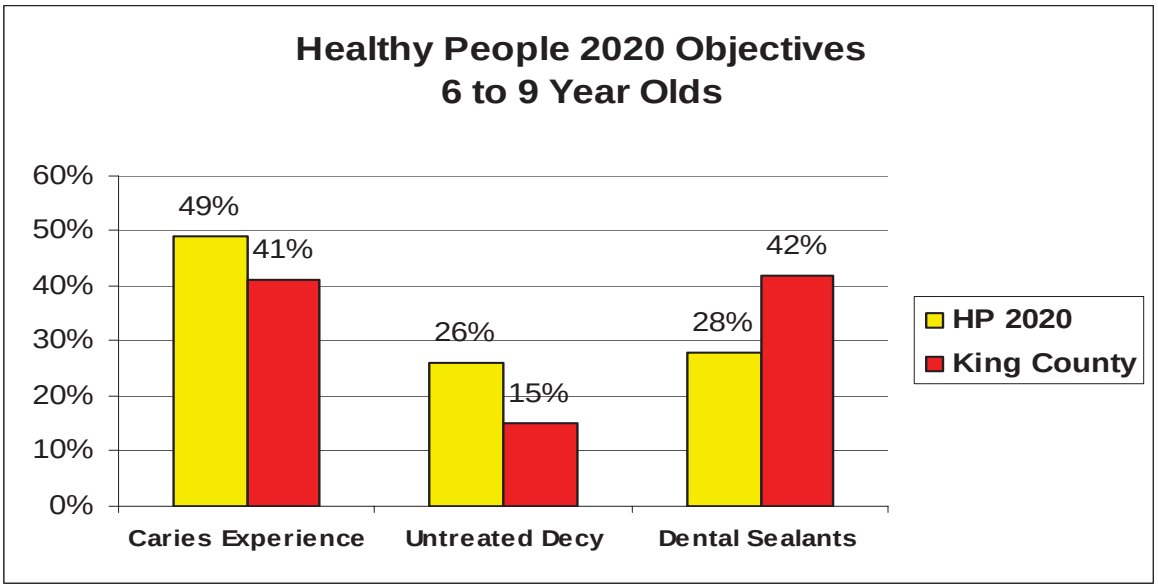
Oral Health Measure	WA State (n=5,733)	King County (n= 4,000)
*Caries Free (no treated or untreated)	51% CI (50.1% - 52.7%)	60% CI (58.7% - 61.8%)
*Caries Experience	49% CI (47.3% - 49.9%)	40% CI (38.2% - 41.3%)
*Treated Decay	41% CI (39.6% - 42.2%)	31% CI (29.5% - 32.4%)
Untreated Decay	14% CI (13.5% - 15.3%)	15% CI (14.3% - 16.6%)
*Rampant Decay	17% CI (15.9% - 17.9%)	13% CI (11.6% - 13.7%)
*Dental Sealants (Third graders only)	51% CI (49.4% - 53.1%)	63% CI (60.3% - 64.7%)

*Substantial difference between state and King County samples

Oral health objectives from the national Healthy People 2020 (HP 2020) Oral Health Goals for children ages 6 to 9 are:

Reducing the proportion of children who have dental caries experience to 49%
Reducing the prevalence of untreated tooth decay to 26%
Increasing the proportion of children who have dental sealants to 28%

King County children 6 to 9 years old exceeded the HP 2020 objective, with caries experience rates of 41%, untreated decay rates of 15% and dental sealant rates of 42%. The objective for parents, dental professionals and health care agencies in King County is to maintain these achievements for future 6 to 9 year old children. (State data for this specific age group is not available for this county report.)



Grade Specific Findings for Elementary School Children

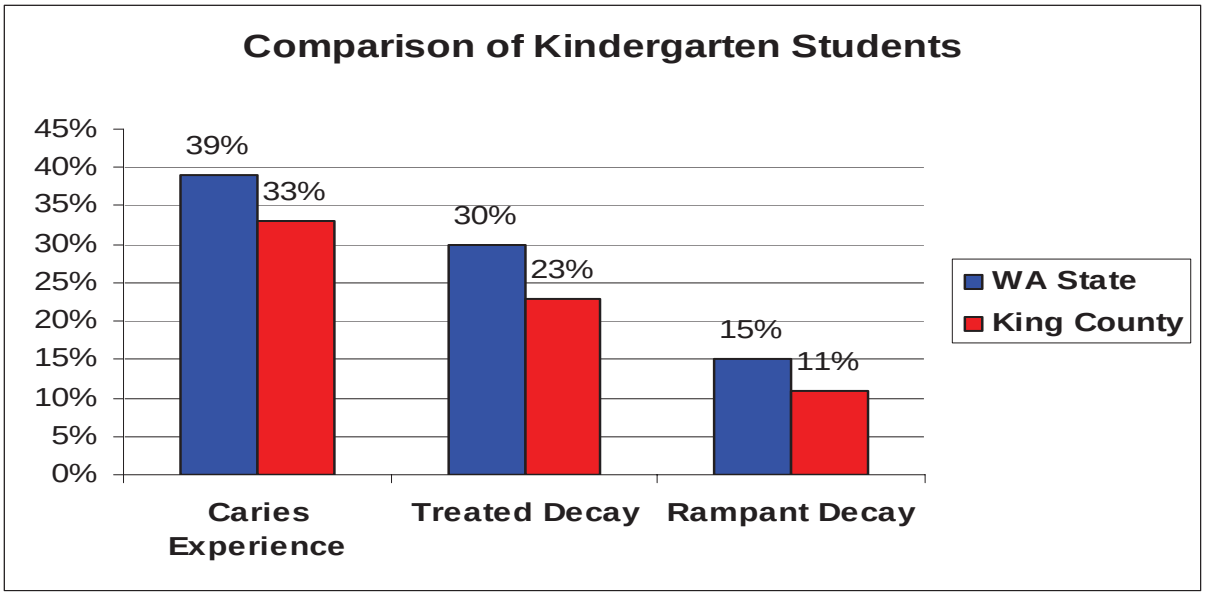
The 2010 Smile Survey sampled kindergarten and third grade students. For oral health measurements, there can be substantial differences between kindergarten and third graders. Kindergarten students are unlikely to have many permanent teeth, especially permanent molars. Dental sealants are only measured on permanent molars, which is why that measurement is reported only on third graders. There can be age-related differences in decay experiences as well as differences in accessing dental care. The following comparison tables are broken down by grade levels.

Table 2: Oral Health Measures for Screened Kindergarten Children, Washington State and King County

Oral Health Measure	WA State (n=2,858)	King County (n= 2,073)
*Caries Free (no treated or untreated)	**61%** CI (58.9% - 62.6%)	**67%** CI (64.7% - 68.4%)
*Caries Experience	**39%** CI (37.4% - 41.1%)	**33%** CI (31.6% - 35.3%)
*Treated Decay	**30%** CI (28.6% - 32.0%)	**23%** CI (21.6% - 25.3%)
Untreated Decay	**14%** CI (12.5% - 15.1%)	**15%** CI (13.2% - 16.3%)
*Rampant Decay	**15%** CI (13.2% - 15.8%)	**11%** CI (10.0% - 12.5%)

**Substantial difference between State and King County samples*

Kindergarten students in King County are more likely to be caries free and have less decay experience. This is reflected in the difference in treated decay where King County children have a lower rate of fillings and a lower rate of rampant decay (fillings or decay on 7 or more teeth). The rates of untreated decay are not substantially different.

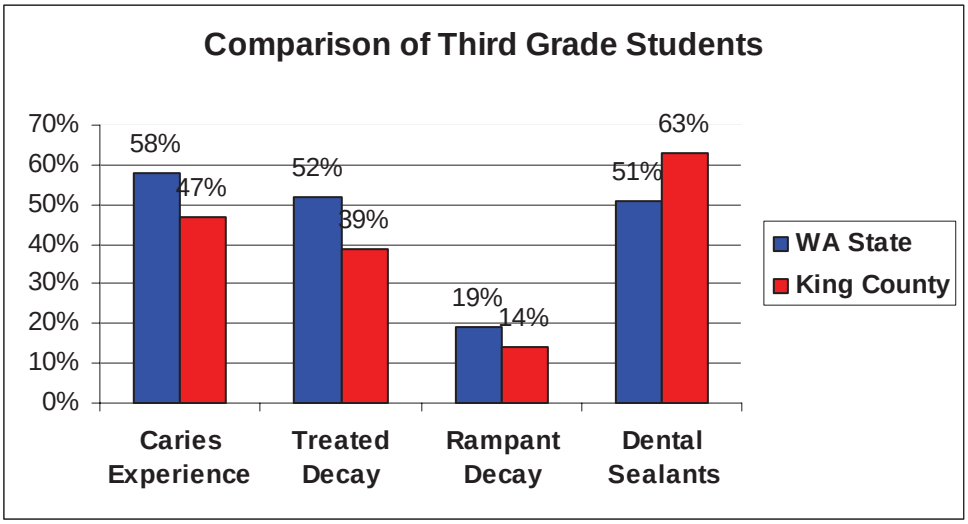


A comparison of third grade students shows a similar pattern. In King County, third grade students are more likely to be decay free, to have less treated decay and less rampant decay; and are also more likely to have dental sealants than third grade students from other areas of Washington state. King County and Washington state rates of untreated decay are not substantially different.

Table 3: Oral Health Measures for Screened Third Graders Washington State and King County

Oral Health Measure	WA State (n=2,875)	King County (n=1,927)
*Caries Free (no treated or untreated)	**42%** CI (40.3% - 43.9%)	**53%** CI (21.0% - 55.5%)
*Caries Experience	**58%** CI (56.1% -59.7%)	**47%** CI (44.5% - 49.0%)
*Treated Decay	**52%** CI (49.6% - 53.3%)-	**39%** CI (36.9% - 41.4%)
Untreated Decay	**15%** CI (13.6% - 16.3%)	**16%** CI (14.6% - 17.9%)
*Rampant Decay	**19%** CI (17.8% - 20.7%)	**14%** CI (12.4% - 15.5%)
*Dental Sealants (3rd Graders only)	**51%** CI (49.4% - 53.1%)	**63%** CI (60.3% - 64.7%)

**Substantial difference between State and King County samples*



Disparities in Burden of Oral Health Disease

The Smile Survey recorded information on race/ethnicity, language spoken at home and participation in free/reduced lunch programs. Findings from the survey show that children from low-income families, children from families of color, and immigrant/refugee families are significantly more likely to suffer from dental disease when compared to children from middle or higher income families, non-minority children and children born in the U.S.

Low Income

Participation in the free/reduced lunch programs is often used as a proxy for low income, as the income standards correspond to 130% and 185% of the Federal Poverty Level. Based on this measure, results indicate that King County children from low-income families have higher rates of dental disease.

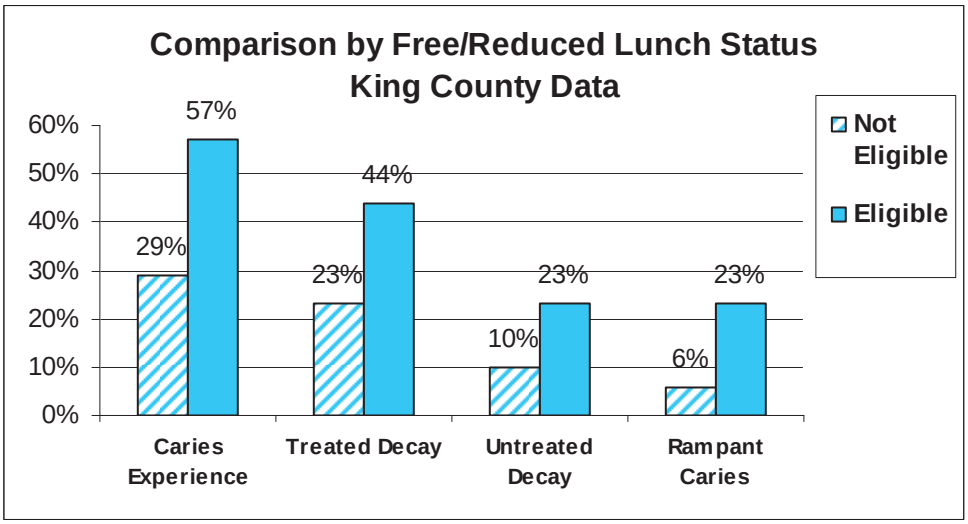
Table 4: Oral Health Measures by Free/Reduced Lunch Eligibility Screened King County Elementary Students

Oral Health Measure	Not Eligible (n=2,433)	Eligible (n=1,555)
*Caries Experience	29% CI (27.1% - 30.8%)	57% CI (54.0% - 59.0%)
*Treated Decay	22.6% CI (19.5% - 25.2%)	44.0% CI (37.3% - 48.1%)
*Untreated Decay	10% CI (9.1% - 11.5%)	23% CI (21.3% - 25.5%)
*Rampant Caries	6% CI (5.1% - 7.0%)	23% CI (21.0% - 25.2%)

**Significant difference between free/reduced lunch eligible and not eligible samples*

Students eligible for free/reduced lunch programs in King County are almost twice as likely to have experienced dental decay; twice as likely to have treated decay, at least twice as likely to

have untreated decay; and almost four times as likely to have rampant decay as student who are not eligible for free/reduced lunch programs.



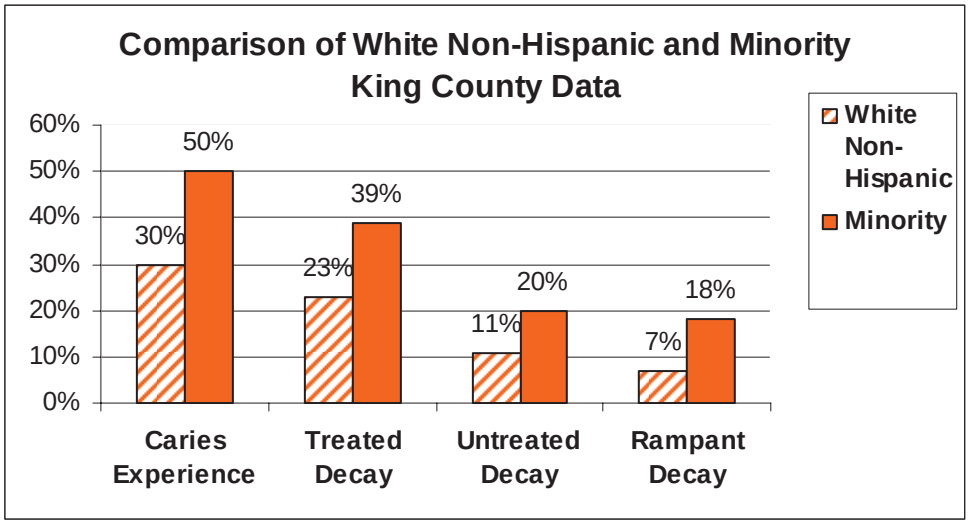
Race/Ethnicity

Dental disease impacts children of color (Hispanic/Latino, African American, American Indian/Alaska Native, Asian, other races) at a significantly higher rate than White Non-Hispanic children. For the categories of caries experience and untreated decay, White Non-Hispanic children show significantly lower rates. Children of color have one-and-a-half times the rate of dental disease (caries experience and treated decay), twice as much difficulty in accessing dental care (untreated decay) and three times the rate of dental disease (rampant caries) as White Non-Hispanic children.

Table 5: Oral Health Measures by Race/Ethnicity
Screened King County Elementary Children

Oral Health Measure	White Non-Hispanic (n=2,308)	Minority (n=1,937)
*Caries Experience	**30%** CI (28.1% - 32.1%)	**50%** CI (47.5% - 52.0%)
*Treated Decay	**23.2%** CI (19.3% - 26.2%)	**39.0%** CI (33.6% - 42.4%)
*Untreated Decay	**11%** CI (9.5% - 12.2%)	**20%** CI (18.5% - 22.2%)
*Rampant Caries	**7%** CI (6.3% - 8.6%)	**18%** CI (16.5% - 20.0%)

**Significant difference between White Non-Hispanic and minority samples*

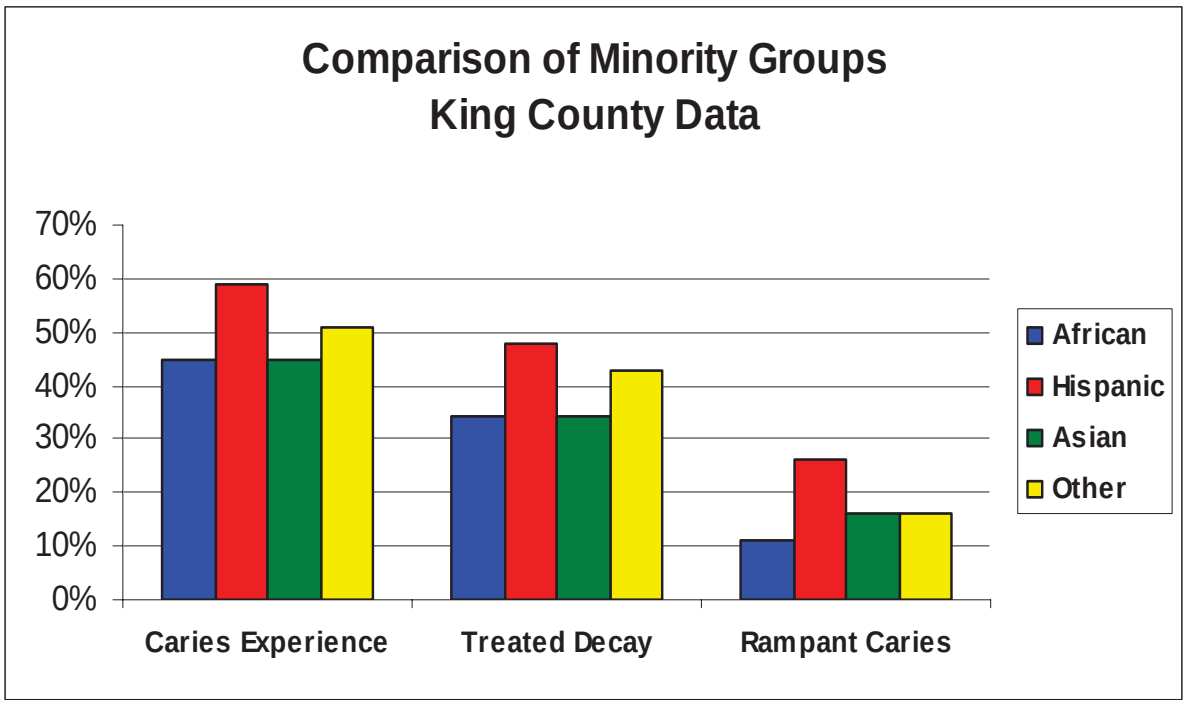


Hispanic/Latino children have significantly higher rates of caries experience, treated decay and rampant decay than African American and Asian children. Hispanic/Latino children are significantly more likely to have rampant decay when compared to all other children of color. There is no statistical difference in the rates of untreated decay.

Table 6: Oral Health Measures by Race/Ethnicity
Screened King County Elementary Children of Color

Oral Health Measure	African American n=505	Hispanic/Latino n=624	Asian n=672	Other Races n=136
*Caries Experience	45% CI (40.8% - 49.6%)	59% CI (54.7% - 62.5%)	45% CI (41.0% - 48.6%)	51% CI (42.0% - 59.4%)
*Treated Decay	34% CI (26.9% - 41.8%)	48% CI (40.0% - 54.3%)	34% CI (27.4% - 39.7%)	43% CI (32.1% - 58.4%)
Untreated Decay	19% CI (15.7% - 22.8%)	22% CI (19.1% - 25.8%)	20% CI (17.3% - 23.5%)	16% CI (10.4% – 23.5%)
*Rampant Caries	11% CI (9.3 – 15.1%)	26% CI (23.1 – 30.1%)	16% CI (13.0% - 18.6%)	16% CI (10.4 – 23.5%)

**Significant differences*



Language

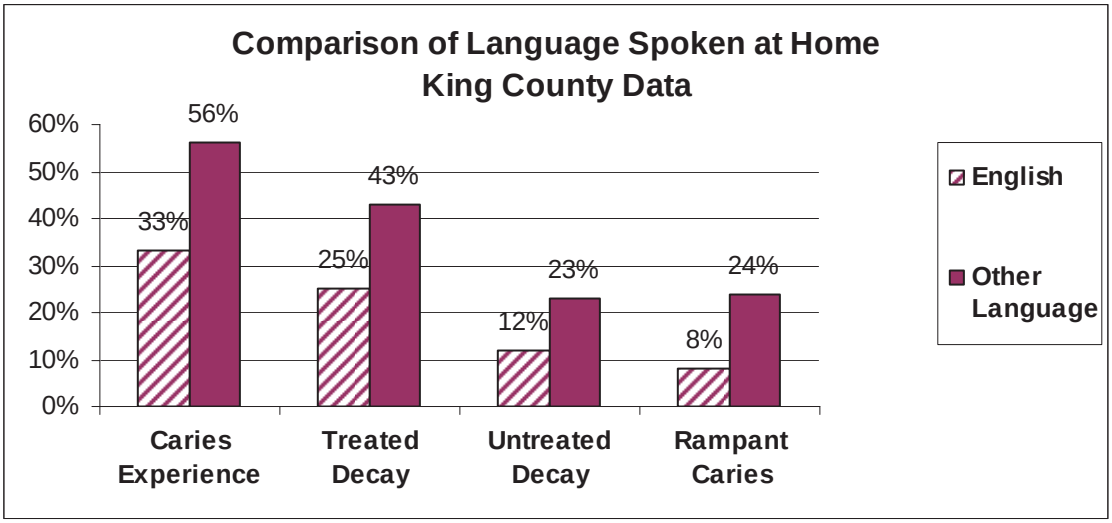
King County data show a difference in oral health measures between students with English as a primary language and those with another language spoken at home. The data mixes students newly arrived in the United States and those whose families have been living in the country for a longer period but maintain original cultural ties.

Table 7: Oral Health Measures by Language Spoken at Home
Screened King County Elementary Children

Oral Health Measure	English (n=2,992)	Other Language (n=1,177)
*Caries Experience	**33%** CI (31.1% - 34.7%)	**56%** CI (52.9% - 58.7%)
*Treated Decay	**25%** CI (21.7% - 27.6%)	**43%** CI (36.3% - 47.6%)
*Untreated Decay	**12%** CI (11.2% - 13.8%)	**23%** CI (20.4% - 25.3%)
*Rampant Caries	**8%** CI (7.0% - 9.1%%)	**24%** CI (21.6% - 26.6%)

**Significant difference between English and non-English speaking sample*

Students whose primary language is not English are more likely to have caries experience and treated decay; almost twice as likely to have untreated decay; and three times as likely to have rampant decay, compared to those whose families speak English at home.



Protective Measures - Dental Sealants (Third Graders only)

Dental sealants are an evidence-based strategy to prevent dental decay. Dental sealants are protective coatings applied to the grooves and pits of permanent molars, areas that are the most vulnerable to decay. Among the 1,927 King County third graders who participated in Smile Survey 2010, there were no economic, race/ethnic or language differences in application of dental sealants. This was the only oral health measure that did not show any disparities.

Table 8: Dental Sealants by Free Reduced Lunch Eligibility, Screened King County Third Graders

	Not Eligible n=1,120	Eligible n=807
Dental Sealants	61% CI (58.0%% - 63.8%)	65% CI (61.4% – 68.1%)

Table 9: Dental Sealants by Race/Ethnicity Screened King County Third Graders

	White Non-Hispanic n=965	Minority n=962
Dental Sealants	62% CI (59.2% - 65.4%)	63% CI (59.5% – 65.7%)

Table 10: Dental Sealants by Language Spoken at Home
Screened King County Third Graders

	English n=1,257	Other Language n=670
Dental Sealants	**62%** CI (59.2% - 64.7%)	**64%** CI (59.8% - 67.2%)

Third grade students from schools with dental sealant programs are significantly more likely to have dental sealants than those from schools without a school-based dental sealant program. The school-based dental sealant programs conducted by Public Health – Seattle & King County began in the Seattle School District in 1986. High-risk schools are targeted based on free/reduced lunch percentages (30% or greater), and the program is offered to all second grade students in targeted schools. In 1995 the program was expanded to include high-risk schools in other King County school districts. The 2010 Smile Survey included 11 schools that participated in the school-based dental sealant program the previous year.

Table 11: Dental Sealants by School Based Sealant Program
Screened King County Third Graders

	School Based Program (n=436)	No School Based Program (n=769)
***Dental Sealants**	**70%** CI (66.4% - 73.8%)	**59%** CI (56.2 – 61.6%)

** Significant difference*

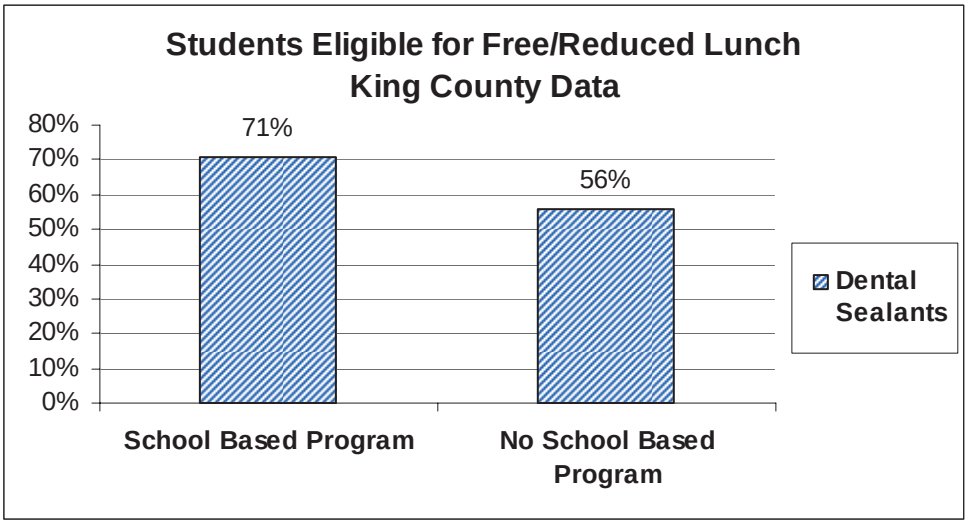
In comparing free/reduced lunch participation, third grade students eligible for the free /reduced lunch program were significantly more likely to have dental sealants if they attended a school with a school-based sealant program than if they attended a school that did not have a sealant program.

Table 12: Dental Sealants by School Based Sealant Program
Screened King County Students Eligible for Free/Reduced Lunch

Students Eligible for Free Reduced Lunch n= 807	School Based Program (n=464)	No School Based Program (n=343)
***Dental Sealants**	**71%** CI (66.7% - 75.2%)	**56%** CI (50.8% – 61.6%)

** Significant difference*

This demonstrates that school-based sealant programs are effective in reaching students at higher risk for dental disease and providing a proven preventive measure.



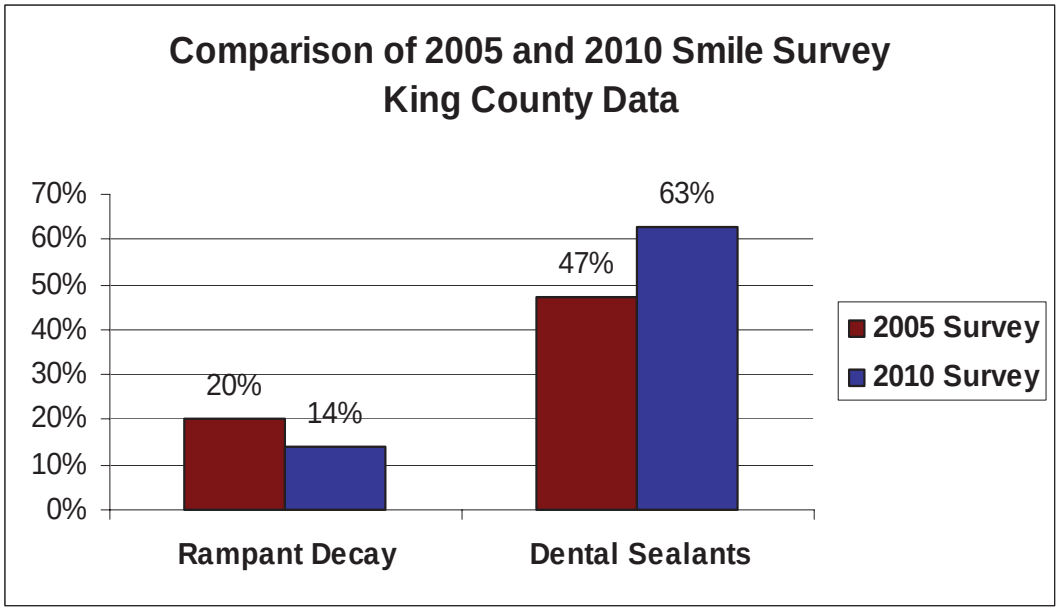
Comparison – 2005 & 2010 Smile Survey – Third Grade Data only

Comparisons between the 2005 and 2010 Smile Surveys should be done cautiously since the types of survey and sampling strategies differed. In 2005, the sample included second and third graders, while in 2010, the sample included kindergarten and third graders. The following comparisons use data from third graders only since disease patterns and use of dental sealants vary between kindergarteners and second graders. From 2005 to 2010, there was no significant difference in the King County rates of caries experience or untreated decay. However, the rate of rampant decay decreased by 6 percentage points (30%), and rate of dental sealants increased by 16 percentage points (34%).

Table 13: Oral Health Measures in 2005 and 2010 Smile Surveys Screened King County Third Graders

Oral Health Measure	2005 (n= 938)	2010 (n=1,927)
Caries Experience	46% CI (NA)	47% CI (NA)
Treated Decay	38.6% CI (16.7% - 44.9%)	39.1% CI (24.1% - 34.3%)
Untreated Decay	16% CI (12.3% - 20.7%)	16% CI (13.9% - 19.0%)
*Rampant Decay	20% CI (17.4% - 22.6%)	14% CI (12.4% - 15.5%)
*Dental Sealants	47% CI (43.7% - 50.2%)	63% CI (60.3% - 64.7%)

**Significant difference between years*



Disparities 2005 and 2010

While there has been overall improvement in some oral health outcomes (rampant decay and dental sealants), disparities continue to exist. The 2005 and 2010 data show continuing patterns of disproportionate disease levels by low income, race/ethnicity and language spoken at home. The only oral health measure that shows no difference between groups is dental sealants. This finding probably reflects the manner in which school-based sealant programs are targeted.

Between the 2005 and 2010 surveys, income-related disparities remained unchanged. There were no significant changes in rate of caries experience or treated or untreated decay among low-income third graders eligible for free/reduced lunches and those not eligible. Rampant decay declined significantly in both groups but the income-related disparity did not disappear.

Table 14: Oral Health Measures by Year and Free/Reduced Lunch Participation Screened King County Third Graders

Oral Health Measure	2005 Non Eligible (n=624)	2010 Non Eligible (n=807)	2005 Eligible (n=311)	2010 Eligible (n=1120)
Caries Experience	36% CI (NA)	36% CI (NA)	67% CI (NA)	62% CI (NA)
Treated Decay	31% CI (13.1% - 38.7%)	30% CI (24.1% - 34.3%)	54% CI (21.0% - 66.3%)	53% CI (41.2% - 59.0%)
Untreated Decay	9% CI (6.1% - 14.4%)	11% CI (9.0% - 15.0%)	29% CI (21.1% - 40.6%)	23% CI (18.7% - 28.2%)
*Rampant Decay	13% CI (10.8% - 16.3%)	7% CI (5.3% - 8.3%)	33% CI (27.7% - 38.4%)	24% CI (21.0% - 27.0%)
*Dental Sealants	50% CI (46.0% - 54.0%)	61% CI (58.0% - 63.8%)	41% CI (35.0% - 46.2%)	65% CI (61.4% - 68.1%)

** Significant differences*

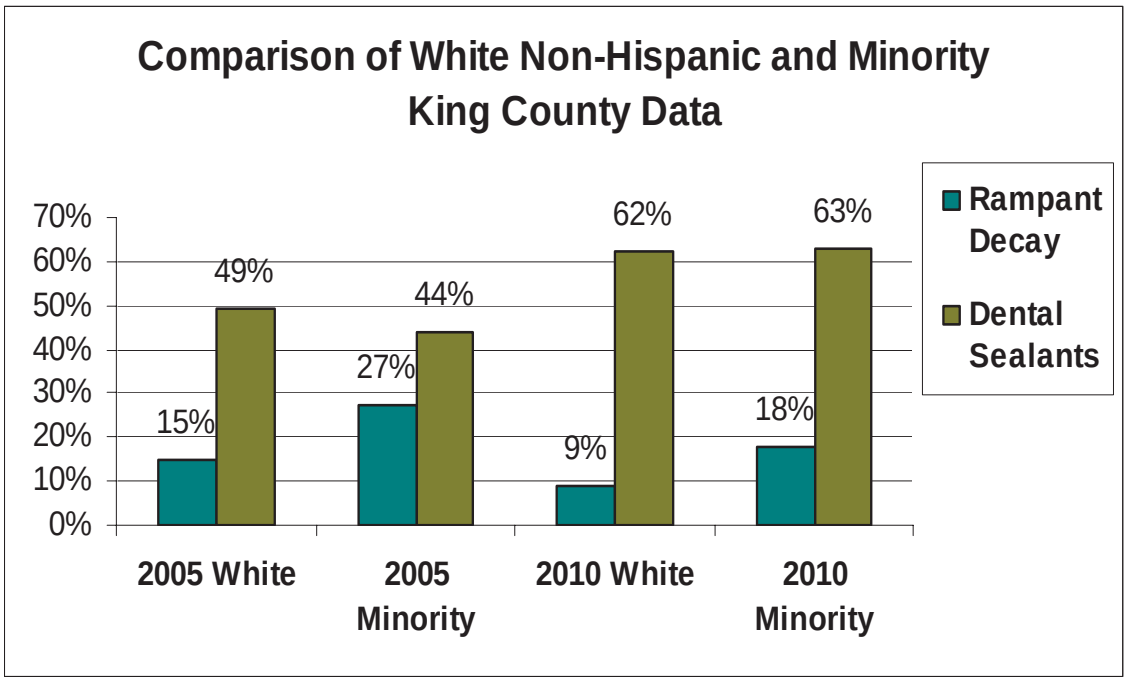
In contrast, use of dental sealants increased in both groups but was significantly higher in 2010 for low-income students. In 2005, students ineligible for free/reduced lunch programs were more likely to have dental sealants on their permanent first molars. While both groups showed increases in dental sealants between 2005 and 2010, the largest increase was within the group of students eligible for free/reduced lunch programs (11% increase for ineligible students vs. a 24% increase for students eligible for free/reduced lunch). The difference in rates of improvement may reflect an increase in the use of sealants in dental offices, but there has also been an increase in school-based sealant programs specifically targeting schools with high free/reduced lunch percentages through Public Health as well as Independent Hygienist Providers. These programs appear to be achieving their objective.

Table 15: Oral Health Measures by Year and Race/Ethnicity Screened King County Third Graders

Oral Health Measure	2005 White Non-Hispanic (n=564)	2010 White Non-Hispanic (n=2,308)	2005 Minority (n=374)	2010 Minority (n=1937)
Caries Experience	37% CI (NA)	38% CI (NA)	60% CI (NA)	55% CI (NA)
Treated Decay	31% CI (12.3% - 39.5%)	32% CI (25.1% - 37.0%)	49% CI (21.1% - 60.6%)	46% CI (37.2% - 52.2%)
Untreated Decay	11% CI (7.2% - 16.8%)	12% CI (9.3% - 15.8%)	24% CI (16.9% - 32.9%)	20% CI (16.9% - 25.2%)
*Rampant Decay	15% CI (12.4% - 18.5%)	9% CI (7.7% - 11.5%)	27% CI (22.6% - 31.9%)	18% CI (15.9% - 20.9%)
*Dental Sealants	49% CI (44.5% - 52.9%)	62% CI (59.21% - 65.4%)	44% CI (39.3% - 49.6%)	63% CI (59.5% - 65.7%)

* *Significant differences*

Disparities persist between White Non-Hispanic and minority children. There has been significant improvement in each group with decreasing rampant decay and increasing dental sealants. But there has been no change in treated decay, untreated decay or caries experience rates within each group between 2005 and 2010. The White Non-Hispanic group consistently shows less disease (caries experience), greater access to care (untreated caries) and less severe disease (rampant caries) than the minority group. Part of the difference may be explained by a 2005-2010 increase in poverty (reflected in increased free/reduced lunch participation) within the minority group compared to the White Non-Hispanic group.



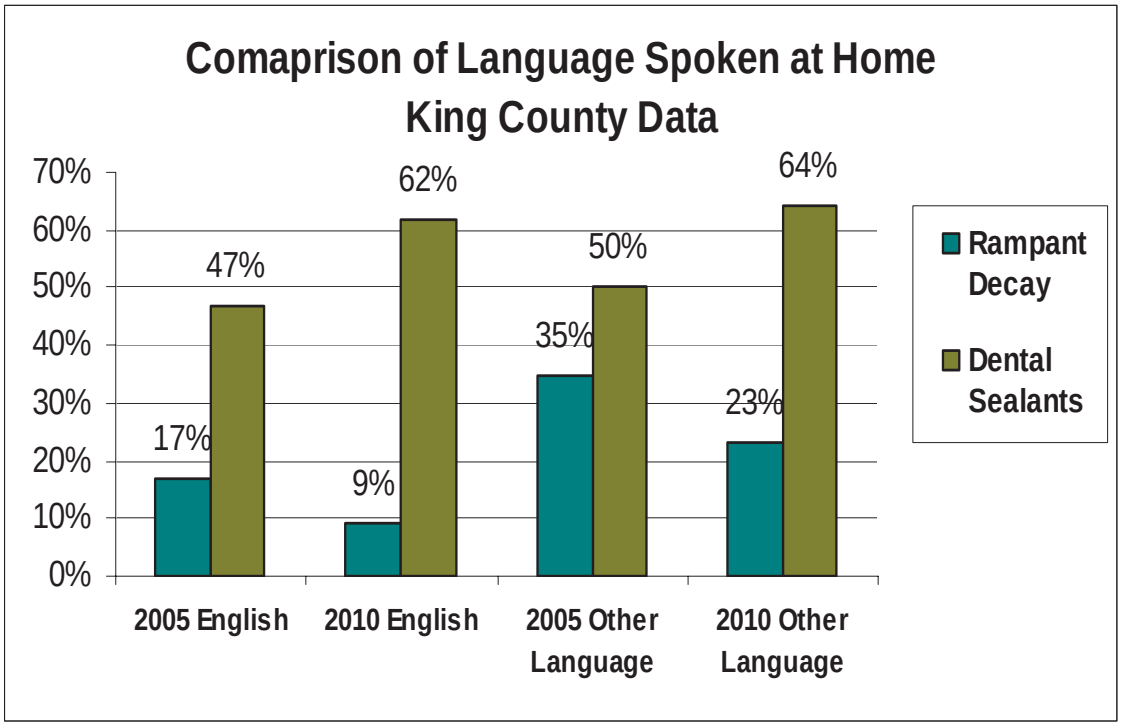
From 2005-2010, there have been significant reductions in rampant decay and increases in use of dental sealants among both children whose primary home language is English and among those who speak another language at home. Despite this progress, language-related disparities persist in rates of caries experience, treated decay, untreated decay and rampant decay.

Table 16: Oral Health Measures by Year and Language Spoken at Home, Screened King County Third Graders

Oral Health Measure	2005 English Primary (n=798)	2010 English Primary (n=1257)	2005 Other Language (n=141)	2010 Other Language (n=670)
Caries Experience	**42%** CI (NA)	**41%** CI (NA)	**71%** CI (NA)	**58%** CI (NA)
Treated Decay	**35%** CI (13.9% - 42.0%)	**34%** CI (27.7% - 38.5%)	**58%** CI (26.9% - 73.7%)	**49%** CI (37.6% - 56%)
Untreated Decay	**14%** CI (10.1% - 18.7%	**13%** CI (10.5% - 16.4%)	**29%** CI (17.4 - 46.3%)	**22%** CI (17.8% - 28.0%)
***Rampant Decay**	**17%** CI (14.8% - 20.1%)	**9%** CI (7.7% - 11.0%)	**35%** CI (26.9% - 43.2%)	**23%** CI (19.5% - 25.9%)
***Dental Sealants**	**47%** CI (43.0% - 50.0%)	**62%** CI (59.2% - 64.7%)	**50%** CI (41.1% - 58.2%)	**64%** CI (59.8% - 67.2%)

* *Significant differences*

The reasons for the decrease in caries experience and rampant decay for the English as a second language group are not known. The increase in dental sealants is most likely related to school-based sealant programs.



Preschool Survey – Head Start/ECEAP Programs

The preschool portion of the survey included 15 Head Start/ECEAP sites in King County with 382 children participating for a response rate of 72%. Sites were randomly selected using the state survey method. Parental consent was obtained. All screenings were conducted by calibrated dental professionals who had attended a survey training session sponsored by DOH. Data analysis was done using the EPI-INFO program produced by the CDC.

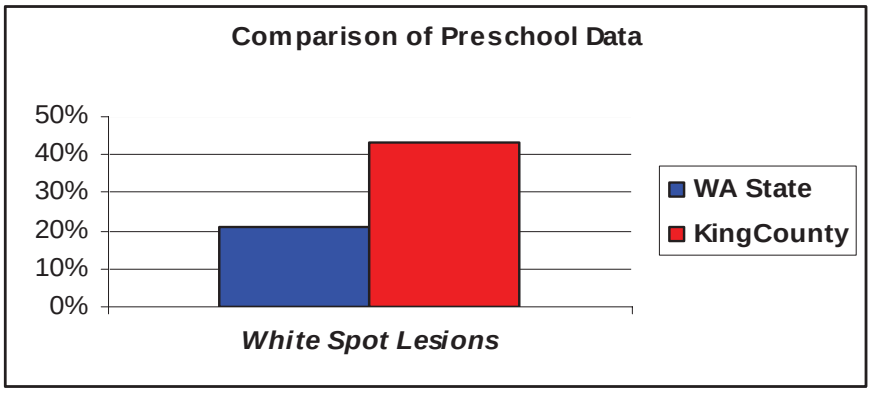
Oral health measures included caries experience (evidence of treated or untreated decay), treated decay, untreated decay, rampant decay (treated or untreated decay on seven or more teeth), Early Childhood Caries (ECC) and white spot lesions. ECC is characterized by dental decay on maxillary front teeth. It is associated with a virulent form of decay-causing bacteria and has been linked to particular infant feeding practices, especially bottle feeding during sleep time. White spot lesions are the initial breakdown of tooth enamel near the gumline. Not all lesions progress to decay.

King County children in Head Start/ECEAP programs and children in programs in other areas of the state show similar rates of most oral health outcomes for this age group. There are significant differences between rates white spot lesions; King County Head Start/ECEAP children are more than twice as likely to have white spot lesions. The reason for this difference is not known.

Table 17: Oral Health Measures in Head Start/ECEAP Children Washington State and King County

Oral Health Measure	State (n=1552)	King County (n=380)
Caries Experience	40% CI (37.8% - 42.8%)	37% CI (31.8% - 41.7%)
Treated Decay	31% CI (29.0% - 33.7%)	27% CI (22.3% - 31.4%)
Untreated Decay	13% CI (11.3% - 14.7%)	17% CI (13.3% - 21.1%)
Rampant Decay	17% CI (15.3% - 19.1%)	12% CI (8.9% - 15.0%)
Early Childhood Caries (ECC)	16% CI (13.7% - 17.4%)	12% CI (9.3% - 16.2%)
*White Spot Lesions	21% CI (18.4% - 22.7%)	43% CI (37.9% - 48.0%)

** Significant differences*



The data indicates that King County children in Head Start/ECEP programs may have a slightly higher rate of caries experience than the HP 2020 objective, but they are meeting the HP 2020 objective for rates of untreated decay. The Healthy People 2020 (HP 2020) objectives for preschool children (ages 3 to 5) are 30.0% for caries experience and 21.4% for untreated decay. There is no significant difference between the HP 2020 objective of 21.4% and the King County rate of 17%. It is also important to note that the Healthy People 2020 objectives are applicable to all children ages 3 to 5 years old regardless of family income, while the State and County Smile Surveys specifically target Head Start/ECEAP children from low-income families.

Differences by race/ethnicity and language spoken at home

The 2010 survey indicates that there is no significant difference in oral health outcomes by race/ethnicity among King County Head Start/ECEAP children. Head Start/ECEAP programs serve low-income families, and the absence of a preschool race/ethnic disparity in oral health reflects the fact that dental disease is strongly related to poverty.

Table 18: Oral Health Measures by Race/Ethnicity
Screened King County Head Start/ECEAP Children

Oral Health Measure	White Non-Hispanic n=47	Minority n=333
Caries Experience	43% CI (28.3% - 57.81%)	36% CI (30.6% - 41.2%)
Treated Decay	29.8% CI (17.3% - 44.9%)	26.0% CI (21.4% - 31.1%)
Untreated Decay	21% CI (10.7% - 35.7%)	16% CI (12.5% - 20.7%)
Rampant Caries	19% CI (9.1% - 33.3%)	11% CI (7.8% - 14.8%)
Early Childhood Caries (ECC)	13% CI (4.8% - 25.7%)	12% CI (9.1% - 16.4%)
White Spot Lesions	45% CI (30.2% - 59.9%)	43% CI (37.3% - 48.2%)

Table 19: Oral Health Measures by Language Spoken at Home
Screened King County Head Start/ECEAP Children

Oral Health Measure	English n=162	Other Language n=217
Caries Experience	34% CI (26.7% - 41.8%)	38% CI (31.8% - 45.1%)
Treated Decay	24.1% CI (17.7% - 31.4%)	28.2% CI (22.3% - 34.6%)
Untreated Decay	19% CI (12.9% - 25.4%)	16% CI (11.1% - 21.2%)
Rampant Caries	10% CI (5.8% - 15.5%)	13% CI (8.7% - 18.1%)
Early Childhood Caries (ECC)	11% CI (6.7% - 17.0%)	13% CI (8.7% - 18.1%)
White Spot Lesions	36% CI (29.0% - 44.3%)	48% CI (40.7% - 54.3%)

As with race/ethnicity comparisons, language spoken at home does not show any significant differences between groups.

Comparison – 2005 & 2010 Smile Survey – Head Start/ECEAP only

The 2005 and 2010 Oral Health measures for Head Start/ECEAP children found significant increases in caries experience (27% vs 37% in 2010) and rampant decay (6% vs 12% in 2010). The rates of untreated decay and ECC did not change. (Data on white spot lesions was not reported in the 2005 Smile Survey.)

Table 20: Oral Health Measures by Year
King County Head Start/ECEAP Children

Oral Health Measure	2005 n=605	2010 n=380
Caries Experience	27% CI (23.2 – 30.4%)	37% CI (31.8% - 41.7%)
Treated Decay	15% CI (12.5% - 18.4%)	27% CI (22.3% - 31.4%)
Untreated Decay	15% CI (12.5% - 18.4%)	17% CI (13.3% - 21.1%)
Rampant Decay	6% CI (4.4% - 8.4%)	12% CI (8.9% - 15.0%)
Early Childhood Caries (ECC)	10% CI (12.7% - 21.4%)	12% CI (9.3% - 16.2%)

There are significant differences between the caries experience (27% vs 37%) and rampant decay (6% vs 12%) while the rates of untreated decay and ECC remained the same. Both caries experience and rampant decay include both untreated and treated decay. The rates of treated decay have increased significantly (15% vs 27%). This increase contributes to the significant increases in the rates for caries experience and rampant decay.

Treating very young children sometimes results in a different approach than treatment for older children or adults. Very young children with extensive decay often require sedation including general anesthesia, which is rare for older children or adults. Since sedation in itself poses a health risk to the patient, dental providers often perform preventive restorations to minimize the risk that the child will need future dental treatment with sedation. Treated decay reflects existing evidence of treatment (fillings or extractions), but it is not possible to determine whether the treatment was performed because of existing disease or for preventive purposes. There is also the possibility that there is some overtreatment of children. Additionally, while we can be proud to see the increase in treated decay as a marker for children getting the care they need, what is ultimately required is disease prevention. Treatment is a measure of the ability to restore the result of dental disease and does little to prevent the disease itself. More emphasis and effort to operationalize current knowledge on the utility of antibacterial and enamel remineralizing treatments, as well as a sustained focus on helping families achieve behavior changes that are good for oral health, are the real solution.

Table 20: ECC by Race/Ethnicity and Year
King County Head Start/ECEAP Children

Oral Health Measure	2005 White Non-Hispanic	2010 White Non-Hispanic	2005 Minority	2010 Minority
ECC	5% CI (NA)	13% CI (4.8% – 25.7%)	11% CI (NA)	12% CI (9.1% - 16.4%)

ECC measurement includes both treated and untreated decay, as in the caries experience measure. The increase in rates for the White Non-Hispanic group from 2005 to 2010 may be following a similar pattern of an increase in the treated decay measure.

Conclusions

Dental decay is a preventable disease that affects children's ability to eat, sleep and attend to learning. Dental decay is a bacterial mediated process that destroys the enamel of a tooth resulting in a cavity or hole. Restorative dentistry repairs the cavity or hole in the tooth structure but does little to address the disease process. It is common for children who have cavities at a young age to continue to get new cavities as they grow up.

There is an additional factor that needs to be accounted for: The definition of a 'cavity' in dentistry has been moving from cavitation to weak and stained grooves. Many school-age children may be just as well or better treated with sealants rather than occlusal fillings on their first molars. The increase in treated decay could be a result of increased decay activity in the current population of children participating in the Smile Survey. Or it could be an increase in treatment provided by dental professionals. The results of this survey suggest more aggressive treatment rather than increased decay. Reimbursement methods that promote aggressive treatment may be influencing dentists' choice of treatment.

From a Public Health perspective, it is important that preventive services are emphasized. Dentistry is already moving in the direction of caries risk assessment, antibacterial modalities and remineralization treatments in order to prevent dental disease. These, along with dental sealants and community water fluoridation, continue to emphasize the prevention of dental disease rather than merely treating the results of dental disease. Additionally, in an age of emphasis on white fillings and cosmetic dentistry, it will be important to continue the discussion over when is a cavity a cavity, to ensure that overtreatment does not occur.

The findings of the 2010 Smile Survey for King County indicate that children continue to be impacted by dental disease, and also suggest avenues to preventing disease and improving children's dental health.

Key findings from the 2010 King County Smile Survey include the following:

1. Children from low-income families are at least twice as likely to have untreated dental disease as those from families with higher income.

Untreated decay is a measure reflective of access to care. The King County region has a range of dental programs and services offered to low-income families, including private dental offices, community dental clinics, Public Health dental clinics, the University of Washington Dental School and other dental programs. Despite these opportunities for care, the 2000, 2005 and 2010 Smile Surveys show that children from low-income families continue to have elevated rates of untreated dental disease compared to the general population. This suggests that barriers to child dental care extend beyond finding a provider.

2. Children of color and children whose primary language is not English are almost twice as likely to have untreated dental disease.

The disproportionate burden of dental disease along racial and ethnic lines continues to be a significant problem. Comparison of the 2000 and 2005 King County surveys indicated this problem, and the 2010 survey show no change in this pattern. Dental disease is primarily a disease of poverty which, like other health issues, increases the chances that significant differences will be found between racial/ethnic groups. Among minority groups, Hispanic/Latino children are likely to have more caries experience and more severe disease than African-American or Asian children. Much has been done to reach and educate the Hispanic community, but the results of the 2010 survey indicate that more still needs to be done to reduce dental disease in Hispanic/Latino children.

3. Dental sealants do not follow the disease pattern of disparity between groups.

Use of dental sealants remains at a high level among Smile Survey participants, regardless of race/ethnicity, income or language. Increased general utilization of dental sealants has contributed to this, as have school-based dental sealant programs that specifically target schools with children at higher risk for dental disease.

4. School-based dental sealant programs in King County significantly increase the chances that third graders will have dental sealants.

Data from both the 2000 and 2005 survey indicated that children in schools with school-based sealant programs were more likely to have the protective benefits of dental sealants. The 2010 survey also supports this.

5. King County children enjoy better oral health than children in other areas of the state.

Untreated disease **is** the only oral health measure that indicates no statistical difference between the Washington state sample and the King County sample. In all other measurements, children from King County demonstrate better oral health through lower rates of caries experience, lower rates of rampant decay and higher rates of dental sealants.

Data Tables

Table 1.1
Elementary School Participation in Smile Survey 2010

	Number of Schools	Number Enrolled	Number Screened	Response Rate
Participating Schools	32	4769	4000	84%

Table 1.2
Enrollment and Free/Reduced Price Lunch Program Participation in all Elementary Schools in Sampling Frame, Sample Schools and Participating Schools

	K & 3rd Grade Enrollment	Percent on FRL	Percent White	Percent Hispanic	Percent African-American	Percent Asian	Percent Other Race
Schools in Sampling Frame (n=270)	38,380	33.7%	51.0%	14.6%	9.6%	17.3%	7.5%
Participating Schools (n=32)	4769	40.1%	47.7%	17.6%	12.6%	15.9%	6.2%
Children Screened (n=4000)	4000	38.9%	51.0%	15.6%	12.6%	16.8%	4.0%

Table 1.3
Demographics of Children Screened

Variable	Kindergarten (n=2073)		3rd Grade (n=1927)		All Grades (n=4000)	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Age						
5 years	891	43.0%	1	0.1%	892	22.3%
6 years	1160	56.0%			1160	29%
7 years	15	0.7%			15	0.4%
8 years	3	0.1%	779	40.5%	782	19.6%
9 years	1	0.05%	1120	58.3%	1121	28%
10 years			22	1.1%	22	0.6%
Missing	3	0.1%	5	0.2%	8	0.2%
Gender						
Male	1049	50.6%	981	50.9%	2030	50.8%
Female	1023	49.3%	943	48.9%	1966	49.2%
Missing/Unknown	1	0.05%	3	0.2%	4	0.1%
Free/Reduced Lunch Eligibility						
Not eligible	1313	63.3%	1120	58.1%	2433	60.8%
Eligible	756	36.5%	799	41.5%	1557	38.9%
Missing/Unknown	4	0.2%	8	0.4%	12	0.3%
Language Spoken at Home						
English	1435	69.2%	1257	65.2%	2692	67.3%
Spanish	276	13.3%	240	12.5%	516	12.9%
Other	298	14.4%	363	18.8%	661	16.5%
Missing/Unknown	64	3.1%	67	3.5%	131	3.3%
Race/Ethnicity						
White	1073	51.8%	965	50.1%	2038	51%
African American	234	11.3%	271	14.1%	505	12.6%
Hispanic	342	16.5%	282	14.6%	624	15.6%
Asian	350	16.9%	322	16.7%	672	16.8%
American Indian/Alaska Native	30	1.4%	25	1.3%	55	1.4%
Other	40	1.9%	41	2.1%	81	2.0%
Missing/Unknown	4	0.2%	21	1.1%	25	0.6%

Table 1.4a
Oral Health Status of All Children Screened

	Number Screened (n=4000)	Percent	Confidence Intervals
Caries free	2411	60.3%	58.7% - 61.8%
Caries experience			
– primary and/or permanent teeth	1589	39.7%	38.2% - 41.3%
Caries experience			
– permanent teeth	144	3.6%	3.1% - 4.2%
Treated decay	1239	31%	29.5% - 32.4%
Untreated decay	616	15.4%	14.3% - 16.6%
Rampant caries	506	12.7%	11.6% - 13.7%
Dental sealants	1335	33.4%	31.9% - 34.9%
Treatment Need			
No obvious problem	3385	84.6%	83.5% - 85.7%
Early dental care needed	587	14.7%	13.6% - 15.8%
Urgent dental care needed	28	0.7%	0.5% - 1.0%

Table 1.4b
Oral Health Status of All Children Screened
Weighted Percentages for Non-Response

	Weighted %	Confidence Intervals
Caries free	59.8%	58.4% - 61.2%
Caries experience		
– primary and/or permanent teeth	40.2%	38.8% - 41.6%
Caries experience		
– permanent teeth	3.7%	3.2% - 4.2%
Treated decay	31.3%	30.0% - 32.6%
Untreated decay	15.6%	14.6% - 16.6%
Rampant caries	12.5%	11.6% - 13.4%
Dental sealants	33.8%	32.4% - 35.1%
Treatment Need		
No obvious problem	84.4%	83.4% - 85.4%
Early dental care needed	14.9%	13.9% - 15.9%
Urgent dental care needed	0.7%	0.5% - 0.9%

Table 1.5a

Oral Health Status of Kindergarten and 3rd Grade Children Screened Stratified by Grade

Total n=4000	Kindergarten (n=2073)			3rd Grade (n=1927)		
	Number Screened	Percent	Confidence Intervals	Number Screened	Percent	Confidence Intervals
Caries free	1385	66.8%	64.7% - 68.8%	1026	53.2%	51.0% - 55.5%
Caries experience – primary and/or permanent teeth	688	33.2%	31.2% - 35.3%	901	46.8%	44.5% - 49.0%
Caries experience – permanent teeth	12	0.6%	0.3% - 1.0%	132	6.9%	5.8% - 8.1%
Treated decay	485	23.4%	21.6% - 25.3%	754	39.1%	36.9% - 41.4%
Untreated decay	304	14.7%	13.2% - 16.3%	312	16.2%	14.6% - 17.9%
Rampant caries	239	11.5%	10.2% - 13.0%	267	13.9%	12.4% - 15.5%
Dental sealants	130	6.3%	5.3% - 7.4%	1205	62.5%	60.3% - 64.7%
Treatment Need						
No obvious problem	1768	85.3%	83.7% - 86.8%	1617	83.9%	82.2% - 85.5%
Early dental care needed	293	14.1%	12.7% - 15.7%	294	15.3%	13.7% - 17.0%
Urgent dental care needed	12	0.6%	0.3% - 1.0%	16	0.8%	0.5% - 1.4%

Table 1.5b

Oral Health Status of Kindergarten and 3rd Grade Children Screened Stratified by Grade With Weighted Percentages for Non-Response

Total n=4000	Kindergarten N=2073		3rd Grade (n=1927)	
	Weighted %	Confidence Intervals	Weighted %	Confidence Intervals
Caries free	66.5%	64.7% - 68.4%	52.7%	50.6% - 54.7%
Caries experience – primary and/or permanent teeth	33.5%	31.6% - 35.3%	47.3%	45.3% - 49.4%
Caries experience – permanent teeth	0.6%	0.3% - 1.0%	7.0%	6.0% - 8.1%
Treated decay	23.5%	21.8% - 26.2%	39.6%	37.7% - 41.6%
Untreated decay	14.9%	13.5% - 16.3%	16.4%	14.9% - 17.9%
Rampant caries	11.2%	10.0% - 12.5%	13.9%	12.5% - 15.4%
Dental sealants	6.1%	5.2% - 7.1%	63.3%	61.3% - 66.2%
Treatment Need				
No obvious problem	85.1%	83.6% - 86.5%	83.7%	82.2% - 85.2%
Early dental care needed	14.4%	13.0% - 15.8%	15.5%	14.0% - 17.0%
Urgent dental care needed	0.5%	0.3% - 0.9%	0.8%	0.5% - 1.3%

Table 1.6a
Distribution of Treated Decay, Untreated Decay and Caries Experience
Among the Primary & Permanent Dentitions of Children Screened

	Kindergarten (n=2073)		3rd Grade (n=1927)		Both Grades (n=4000)	
	Percent	**Confidence Intervals**	**Percent**	**Confidence Intervals**	**Percent**	**Confidence Intervals**
Treated Decay						
No treated decay	76.6%	74.7% - 78.4%	60.9%	58.6% - 63.1%	69.0%	67.6% - 70.5%
Primary teeth only	23.1%	21.3% - 24.9%	34.1%	32.0% - 36.3%	28.4%	27.0% - 29.8%
Primary and permanent teeth	0.3%	0.1% - 0.7%	4.0%	3.2% - 5.1%	2.1%	1.7% - 2.6%
Permanent teeth only	0	0	1.0%	0.6% - 1.6%	0.5%	0.3% - 0.8%
Untreated Decay						
No untreated decay	85.3%	83.7% - 86.8%	83.8%	82.1% - 85.4%	84.6%	83.4% - 85.7%
Primary teeth only	14.4%	13.0% - 16.0%	13.8%	12.3% - 15.4%	14.1%	13.1% - 15.3%
Primary and permanent teeth	0.1%	0.0% - 0.4%	1.0%	0.7% - 1.6%	0.6%	0.4% - 0.8%
Permanent teeth only	0.1%	0.0% - 0.5%	1.0%	0.9% - 2.0%	0.7%	0.5% - 1.1%
Caries Experience						
No caries experience	66.8%	64.7% - 68.8%	53.2%	51.0% - 55.5%	60.3%	58.7% - 61.8%
Primary teeth only	32.6%	30.6% - 34.7%	39.9%	37.7% - 42.1%	36.1%	34.6% - 37.6%
Primary and permanent teeth	0.5%	0.2% - 0.9%	5.5%	4.5% - 6.6%	2.9%	2.4% - 3.5%
Permanent teeth only	0.1%)	0.0% - 0.4%	1.3%	0.9% - 20.%	0.7%	0.5% - 1.0%

Table 1.6b
Distribution of Treated Decay, Untreated Decay and Caries Experience
Among the Primary & Permanent Dentitions of Children Screened
Weighted Percentages for Non-Response

	Kindergarten (n=2073)		3rd Grade (n=1927)		Both Grades (n=4000)	
	Weighted %	Confidence Intervals	Weighted %	Confidence Intervals	Weighted %	Confidence Intervals
Treated Decay						
No treated decay	76.5%	74.8% - 78.2	60.4%	58.4% - 62.3%	68.7%	67.4% - 70.0)
Primary teeth only	23.1%	21.5% - 24.8%	34.8%	32.8% - 36.7%	28.8%	27.5% - 30.0%
Primary and permanent teeth	0.3%	0.2% - 0.7%	3.9%	3.2% - 4.8%	2.1%	1.7% - 2.5%
Permanent teeth only	0	0	0.9%	0.6% - 1.4%	0.5%	0.3% - 0.7%
Untreated Decay						
No untreated decay	85.1%	83.7% - 86.5%	83.6%	82.1% - 85.1%	84.4%	83.4% - 85.4%
Primary teeth only	14.6%	13.3% - 16.1%	13.7%	12.4% - 15.2%	14.2%	13.2% - 15.2%
Primary and permanent teeth	0.1%	0.0% - 0.3%	1.2%	0.8% - 1.7%	0.6%	0.4% - 0.9%
Permanent teeth only	0.1%	0.0% - 0.4%	1.5%	1.0% - 2.1%	0.8%	0.6% - 1.1%
Caries Experience						
No caries experience	66.5%	64.7% - 68.4%	52.7%	50.6% - 54.7%	59.8%	58.4% - 61.2%
Primary teeth only	32.9%	31.1% - 34.8%	40.4%	38.4% - 42.4%	36.5%	35.2% - 37.9%
Primary and permanent teeth	0.5%	0.3% - 0.9%	5.7%	4.8% - 6.7%	3.0%	2.5% - 3.5%
Permanent teeth only	0.1%	0.0% - 0.3%	1.3%	0.9% - 1.9%	0.7%	0.5% - 1.0%

Table 1.7a
Oral Health of Kindergarten and 3rd Grade Children Screened Stratified by Race/Ethnicity
Number and Percent of Children

Variable **Total n=3975** **(25 Missing/Unknown not included)**	**White (n=2038)**	**African American (n=505)**	**Hispanic (n=624)**	**Asian (n=672)**	**Other (n=136)**
Caries experience – primary and/or perm	612 (30.0%) CI (28.1% - 32.1%)	228 (45.1%) CI (40.8% - 49.6%)	366 (58.7%) CI (54.7% - 62.5%)	301 (44.8%) CI (41.0% - 48.6%)	69 (50.7%) CI (42.0% - 59.4%)
Caries experience – permanent teeth	55 (2.7%) CI (2.1% - 3.5%)	30 (5.9%) CI (4.1% - 8.5%)	29 (4.6%) CI (3.2% - 6.7%)	23 (3.4%) CI (2.2% - 5.2%)	7 (5.1%) CI (2.1% - 10.3%)
Treated decay	474 (23.2%) CI (19.5% - 26.2%)	173 (34.3%) CI 26.9% - 41.8%	297 (47.6%) CI (40.0% - 54.3%)	225 (33.5%) CI (27.4% - 39.7%)	70 (42.5%) CI (32.1% - 58.4%)
Untreated decay	219 (10.7%) CI (9.5% - 10.7%)	96 (19.0%) CI (15.7% - 22.8%)	139 (22.3%) CI (19.1% - 25.8%)	136 (20.2%) CI (17.3% - 23.5%)	22 (16.2%) CI (10.4% - 23.5%)
Rampant caries	150 (7.4%) CI (6.3% - 8.6%)	60 (11.9%) CI (9.3% - 15.1%)	165 (26.4%) CI (23.1% - 30.1%)	105 (15.6%) CI (13.0% - 18.6%)	22 (16.2%) CI (10.4% - 23.5%)
Need early or urgent treatment	218 (10.7%) CI (9.4% - 12.1%)	96 (19.0%) CI (15.7% - 22.8%)	141 (22.6%) CI (19.4% - 26.1%)	135 (20.1%) CI (17.2% - 23.4%)	21 (15.4%) CI (9.8% - 22.6%)
Need urgent treatment	4 (0.2%) CI (0.1% - 0.5%)	7 (1.4%) CI (0.6% - 3.0%)	8 (1.3%) CI (0.6% - 2.6%)	7 (1.0%) CI (0.5% - 2.2%)	2 (1.5%) CI (0.2% - 5.2%)
Third Grade Children Only	n=965	n=271	n=282	n=322	n=66
Dental sealants	602 (62.4%) CI (59.2% - 65.4%)	175 (64.6%) CI (58.6% - 70.3%)	195 (69.1%) CI (63.4% - 74.5%)	186 (57.8%) CI (52.2% - 63.2%)	38 (57.6%) CI (44.8% - 69.7%)

Table 1.8a
Oral Health of Kindergarten and 3rd Grade Children Screened
Stratified by Race/Ethnicity

Variable Total n=3975 (25 Missing/Unknown not included)	White Non-Hispanic (n=2038)	Confidence Intervals	Minority (n=1937)	Confidence Intervals
Caries experience – primary and/or perm	612 (30.0%)	28.1% - 32.1%	964 (49.8%)	47.5% - 52.0%
Caries experience – permanent teeth	55 (2.7%)	2.1% - 3.5%	89 (4.6%)	3.7% - 5.6%
Treated decay	474 (23.2%)	19.3% - 26.2%	765 (39.0%)	33.6% - 42.5%
Untreated decay	219 (10.7%)	9.5% - 12.2%	393 (20.3%)	18.5% - 22.2%
Rampant caries	150 (7.4%)	6.3% - 8.6%	352 (18.2%)	16.5% - 20.0%
Need early or urgent treatment	218 (10.7%)	9.4% - 12.1%	393 (20.3%)	18.5% - 22.2%
Need urgent treatment	4 (0.2%)	0.1% - 0.5%	24 (1.2%)	0.8% - 1.9%
Third Grade Children Only	n=965		n=941	
Dental Sealants	602 (62.4%)	59.2% - 65.4%	594 (63.1%)	59.9% - 66.2%

Table 1.8b
Oral Health of Kindergarten and 3rd Grade Children Screened
Stratified by Race/Ethnicity
Weighted Percentage for Non-Response

Variable Total n=3975 (25 Missing/Unknown not included)	White Non-Hispanic Weighted %	Confidence Intervals	Minority Weighted %	Confidence Intervals
Caries experience – primary and/or perm	30.2%	28.3% - 32.0%	50.1%	48.1% - 52.1%
Caries experience – permanent teeth	2.6%	2.0% - 3.3%	4.8%	4.0% - 5.7%
Treated decay	23.4%	20.0% - 26.1%	39.1%	34.0% - 42.2%
Untreated decay	10.7%	9.6% - 12.1%	20.5%	18.9% - 22.1%
Rampant caries	7.2%	6.2% - 8.3%	17.8%	16.3% - 19.4%
Need early or urgent treatment	10.7%	9.54% - 12.0%	20.4%	18.9% - 22.1%
Need urgent treatment	0.2%	0.1% - 0.5%	1.1%	0.8% - 1.6%
Third Grade Children Only				
Dental Sealants	63.0%	60.1% - 65.7%	64.%	61.2% - 66.7%

Table 1.9a
Oral Health of Kindergarten and 3rd Grade Children Screened
Stratified by Language Spoken at Home

Variable Total n=3869 (131 Missing/Unknown not included)	English (n=2692)	Confidence Intervals	Other Language (n=1177)	Confidence Intervals
Caries experience – primary and/or perm	885 (32.9%)	31.1% - 34.7%	657 (55.8%)	52.9% - 58.7%
Caries experience – permanent teeth	71 (2.6%)	2.1% - 3.3%	72 (6.1%)	4.8% - 7.7%
Treated decay	674 (25.1%)	21.7% - 27.6%	565 (43.2%)	36.3% - 47.6%
Untreated decay	335 (12.4%)	11.2% - 13.8%	268 (22.8%)	20.4% - 25.3%
Rampant caries	215 (8.0%)	.0% - 9.1%	283 (24.0%)	21.6% - 26.6%
Need early or urgent treatment	334 (12.4%)	11.2% - 13.7%	268 (22.8%)	20.4% - 25.3%
Need urgent treatment	11 (0.4%)	0.2% - 0.8%	16 (1.4%)	0.8% - 2.2%
Third Grade Children Only	n=1257		n=603	
Dental Sealants	779 (62.0%)	59.2% - 64.7%	400 (66.3%)	62.4% - 70.1%

Table 1.9b
Oral Health of Kindergarten and 3rd Grade Children Screened
Stratified by Language Spoken at Home
Weighted Percentage for Non-Response

Variable Total n=3869 (131 Missing/Unknown not included)	English Weighted %	Confidence Intervals	Other Language Weighted %	Confidence Intervals
Caries experience – primary and/or perm	33.3%	31.7% - 35.0%	55.7%	53.1% - 58.3%
Caries experience – permanent teeth	2.6%	2.1% - 3.2%	6.4%	5.2% - 7.8%
Treated decay	25.3%	22.2% - 27.6%	43.3%	36.8% - 47.3%
Untreated decay	12.7%	11.6% - 13.9%	22.6%	20.5% - 24.8%
Rampant caries	7.9%	7.0% - 8.0%	23.2%	21.1% - 25.4%
Need early or urgent treatment	12.6%	11.5% - 13.8%	22.6%	20.5% - 24.8%
Need urgent treatment	0.4%	0.2% - 0.7%	1.3%	0.8% - 2.0%
Third Grade Children Only				
Dental Sealants	62.2%	59.7% - 64.6%	67.8%	64.3% - 71.0%

Table 1.10a
Oral Health of Kindergarten and 3rd Grade Children Screened
Stratified by Eligibility for the FRL Program

Variable Total n=3988 (12 Missing/Unknown not included)	Not Eligible (n=2433)	Confidence Intervals	Eligible (n=1555)	Confidence Intervals
Caries experience – primary and/or perm	704 (28.9%)	27.1% - 30.8%	879 (56.5%)	54.0% - 59.0%
Caries experience – permanent teeth	52 (2.1%)	1.6% - 2.8%	92 (5.9%)	4.8% - 7.2%
Treated decay	550 (22.6%)	19.5% - 25.2%	685 (44.0%)	37.3% - 48.1%
Untreated decay	249 (10.2%)	9.1% - 11.5%	363 (23.3%)	21.3% - 25.5%
Rampant caries	145 (6.0%)	5.1% - 7.0%	358 (23.0%)	21.0% - 25.2%
Need early or urgent treatment	247 (10.2%)	9.0% - 11.4%	364 (23.4%)	21.3% - 25.6%
Need urgent treatment	6 (0.2%)	0.1% - 0.6%	22 (1.4%)	0.9% - 2.2%
Third Grade Children Only	n=1120		n=799	
Dental Sealants	686 (60.9%)	58.0% - 63.8%	520 (65.1%)	61.6% - 68.4%

Table 1.10b
Oral Health of Kindergarten and 3rd Grade Children Screened
Stratified by Eligibility for the FRL Program
Weighted Percentage for Non-Response

Variable Total n=3988 (12 Missing/Unknown not included)	Not Eligible Weighted %	Confidence Intervals	Eligible Weighted %	Confidence Intervals
Caries experience – primary and/or perm	29.4%	27.7% - 31.0%	56.6%	54.4% - 58.9%
Caries experience – permanent teeth	2.2%	1.7% - 2.9%	5.9%	4.9% - 7.0%
Treated decay	22.9%	20.0% - 25.3%	44.1%	37.7% - 47.7%
Untreated decay	10.6%	9.5% - 11.7%	23.2%	21.3% - 25.1%
Rampant caries	6.0%	5.2% - 6.9%	22.3%	20.5% - 24.3%
Need early or urgent treatment	10.5%	9.4% - 11.7%	23.2%	21.3% - 25.1%
Need urgent treatment	0.2%	0.1% - 0.5%	1.3%	0.9% - 2.0%
Third Grade Children Only				
Dental Sealants	61.2%	58.5% - 63.8%	66.4%	63.3% - 69.3%

Table 2.1
Head Start and ECEAP Participation in Smile Survey 2010

	Number of Sites	Enrollment	Number Screened	Response Rate
Participating Sites	15	528	382	72%

Table 2.2
Age, Gender, Language Spoken at Home, and Race of Head Start/ECEAP Children Screened

Variable	All Children Screened		3-5 Year Olds Only	
	Number	Percent	Number	Percent
Age				
1 year				
2 years				
3 years	47	12.3%	47	12.4%
4 years	179	46.9%	179	47.1%
5 years	154	40.3%	154	40.5%
6 years	2	0.5%		
Gender				
Male	192	50.3%	192	50.5%
Female	190	49.7%	188	49.5%
Missing/Unknown				
Language Spoken at Home				
English	162	42.4%	162	42.6%
Spanish	99	25.9%	99	26.1%
Other	120	31.4%	118	31.1%
Missing/Unknown	1	0.3%	1	0.3%
Race/Ethnicity				
White	47	12.3%	47	12.4%
African American	145	38.0%	145	38.2%
Hispanic	105	27.5%	105	78.2%
Asian	78	20.4%	76	20.0%
American Indian/Alaska Native	6	1.6%	6	1.6%
Other	1	0.3%	1	0.3%
Missing/Unknown				

Table 2.3
Oral Health Status of Head Start and ECEAP Children Screened

	All Children (n=382)	3-5 Year Olds Only (n=380)
	Percent of Children	Percent of Children
Caries free	63.4% CI (58.3% - 68.2%)	63.4% CI (58.3% - 68.2%)
Caries experience	36.6% CI (31.8% - 41.7%)	36.6% CI (31.8% - 41.7%)
Treated decay	26.4% CI (22.1% - 31.2%)	26.6% CI (22.3% - 31.4%)
Untreated decay	17.0% CI (13.5% - 21.2%)	16.8% CI (13.3% - 21.1%)
Rampant decay (or a history of)	11.8% CI (8.8% - 15.5%)	11.8% CI (8.9% - 15.6%)
Early childhood cavities	12.3% CI (9.3% - 16.1%)	12.4% CI (9.3% - 16.2%)
White spot lesions	42.9% CI (37.9% - 48.1%)	42.9% CI (37.9% - 48.0%)
Treatment Need		
No obvious problem	83.0% CI (78.8% - 86.6%)	83.2% CI (79.0% - 86.8%)
Early dental care needed	17.0% CI (13.5% - 21.2%)	16.8% CI (13.3% - 21.1%)
Urgent dental care needed	0	0

Table 2.4
Distribution of Treated and Untreated Decay among Head Start/ECEAP Children Screened
Number of Children (Percent of Total)

Treated Decay	Untreated Decay	
	No Untreated Decay	Untreated Decay
No Treated Decay	242 (63.4%)	39 (10.2%)
Treated Decay	75 (19.6%)	26 (6.8%)

Table 2.5
Oral Health Status of Head Start and ECEAP Children Screened Stratified by Race/Ethnicity
3 to 5 Year Olds Only

Variable	White (n=47)	African American (n=145)	Hispanic (n=105)	Asian (n=76)	Other (n=7)
	Percent of Children	Percent of Children	Percent of Children	Percent of Children	Percent of Children
Caries experience	42.6% CI (28.3% - 57.8%)	28.3% CI (21.1% - 36.3%)	44.8% CI (35.0% - 54.8%)	36.8% CI (26.1% - 48.7%)	42.9% CI (9.9% - 81.6%)
Treated decay	29.8% CI (17.3% - 44.9%)	21.4% CI (15.0% - 29.0%)	33.3% CI (24.4% - 43.2%)	24.4% CI (15.3% - 35.4%)	28.6% CI (3.7% - 71.0%)
Untreated decay	21.3% CI (10.7% - 35.7%)	12.4% CI (7.5% - 18.9%)	21.9% CI (14.4% - 31.0%)	15.8% CI (8.4% - 26.0%)	14.3% CI (0.4% - 57.9%)
Rampant caries	19.1% CI (9.1% - 33.3%)	8.3% CI (4.3% - 14.0%)	12.4% CI (6.8% - 20.2%)	11.8% CI (5.6% - 21.3%)	28.6% CI (3.7% - 71.0%)
Early childhood caries	12.8% CI (4.8% - 25.7%)	9.7% CI (5.4% - 15.7%)	13.3% CI (7.5% - 21.4%)	14.5% CI (7.5% - 24.4%)	28.6% CI (3.7% - 71.0%)
White spots	44.7% CI (30.2% - 59.9%)	34.5% CI (26.8% - 42.8%)	55.2% CI (45.2% - 65.0%)	39.5% CI (28.4% - 51.4%)	57.1% CI (18.4% - 90.1%)
Need early or urgent treatment	21.3% CI (10.7% - 35.7%)	12.4% CI (7.5% - 18.9%)	21.9% CI (14.4% - 31.0%)	15.8% CI (8.4% - 26.0%)	14.3% CI (0.4% - 57.9%)
Need urgent treatment	0	0	0	0	0

Table 2.6
Oral Health Status of Head Start and ECEAP Children Screened Stratified by Race
3 to 5 Year Olds Only

Variable	White Non-Hispanic (n=47)	Minority (n=333)
	Percent of Children	Percent of Children
Caries experience	42.6% CI (28.3% - 57.8%)	35.7% CI (30.6% - 41.2%)
Treated decay	29.8% CI (17.3% - 44.9%)	26.0% CI (24.1% - 31.1%)
Untreated decay	21.3% CI (10.7% - 35.7%)	16.2% CI (12.5% - 20.7%)
Rampant caries	19.1% CI (9.1% - 33.3%)	10.8% CI (7.8% - 14.8%)
Early childhood caries	12.8% CI (4.8% - 25.7%)	12.3% CI (9.1% - 16.4%)
White spots	44.7% CI (30.2% - 59.9%)	42.6% CI (37.3% - 48.2%)
Need early or urgent treatment	21.3% CI (10.7% - 35.7%)	16.2% CI (12.5% - 20.7%)
Need urgent treatment	0	0

Table 2.7
Oral Health Status of Head Start and ECEAP Children Screened Stratified by Language
3 to 5 Year Olds Only

Variable	English (n=162)	Other Language (n=217)
	Percent of Children	Percent of Children
Caries experience	34.0% CI (26.7% - 41.8%)	38.2% CI (31.8% - 45.1%)
Treated decay	24.1% CI (17.7% - 31.4%)	28.2% CI (22.3% - 34.6%)
Untreated decay	18.5% CI (12.9% - 25.4%)	15.7% CI (11.1% - 21.2%)
Rampant caries	9.9% CI (5.8% - 15.5%)	12.9% CI (8.7% - 18.1%)
Early childhood caries	11.1% CI (6.7% - 17.0%)	12.9% CI (8.7% - 18.1%)
White spots	36.4% CI (29.0% - 44.3%)	47.5% CI (40.7% - 54.3%)
Need early or urgent treatment	18.5% CI (12.9% - 25.4%)	15.7% CI (11.1% - 21.2%)
Need urgent treatment	0	0

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